

Message Text

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ACTION COME-00

INFO OCT-01 EA-10 ISO-00 EB-07 OES-05 EPA-04 FEAE-00 INT-05

RSC-01 /033 W

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R 291000Z JAN 75

FM AMEMBASSY TOKYO

TO SECSTATE WASHDC 7645

UNCLAS TOKYO 1208

DEPT PASS COMMERCE FOR ASSISTANT SECRETARY ANCKER-JOHNSON

E.O. 11652: N/A

TAGS: TECH, JA

SUBJECT: SPECIAL PANEL TO STUDY SULFUR OXIDE CONTROL TECHNOLOGY

REF: STATE 008995

1. AS REQUESTED REFTEL, SCICOUNS HAS REVIEWED STATUS OF JAPANESE SULFUR DIOXIDE CONTROL TECHNOLOGY WITH HIRONORI HAMANAKA, HEAD OF EMISSION STANDARDS SECTION OF ENVIRONMENT AGENCY'S BUREAU OF AIR POLLUTION CONTROL. BY WAY OF BACKGROUND, HAMANAKA EXPLAINED THAT SULFUR DIOXIDE CONTROLS IN JAPAN CURRENTLY PLACE LIMITS ON SO₂ CONCENTRATION OF STACK GAS IN ACCORDANCE WITH FORMULA WHICH RELATES SO₂ CONCENTRATION AT GROUND LEVEL TO STACK HEIGHT AND STACK GAS CONCENTRATION. THIS FORMULA CONTAINS A CONSTANT (K) WHICH IS FIXED FOR EACH OF SEVEN DIFFERENT CATEGORIES OF AREAS (REFERRED TO AS RANKS) IN JAPAN, WITH LOWER VALUE OF CONSTANT ASSIGNED TO AREAS OF ALREADY HIGH SO₂ CONCENTRATION. FOR EXAMPLE, K VALUE FOR HEAVILY POLLUTED TOKYO AREA IS NOW 3.5, WHILE K VALUE FOR LEAST POLLUTED UNINDUSTRIALIZED AREAS IS 17.5. MOREOVER, SPECIAL STANDARDS OF 1/3 THE REGULAR STANDARDS ARE APPLIED TO NEW FACILITIES IN EACH THE THREE MOST POLLUTED REGIONS. K VALUES ARE LOOWERED PERIODICALLY WITH THE GOAL OF REACHING 0.02 PPM SO₂ ON ANNUA

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AVERAGE BASIS BY 1978. THIS CONTROL SYSTEM, BASED ON STACK GAS CONCENTRATION, IS NOW IN PROCESS OF BEING CHANGED TO SYSTEM BASED ON TOTAL MASS OF SO₂ RELEASED. NEW SYSTEM REQUIRES THAT REGIONAL

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PLANS BE WORKED OUT BY PREFECTURAL GOVERNMENTS SO AS TO

MEET AMBIENT AIR QUALITY STANDARDS BY MARCH 1978.

2. EACH TIME K VALUES ARE LOWERED (FOR EXAMPLE, PERIOD SIX IS NOW IN PROGRESS, AND STILL LOWER PERIOD VII VALUES WILL COME INTO FORCE IN FEBRUARY 75), FACILITIES HAVE TWO OPTIONS FOR MEETING NEW STANDARDS:

A) BY REDUCTION OF STACK GAS SO₂ CONCENTRATIONS THROUGH USE OF LOWER SULFUR FUELS. IN THIS CASE, IMMEDIATE COMPLIANCE IS REQUIRED, OR

B) BY INSTALLATION OF STACK-GAS CLEANING FACILITIES. IN THIS CASE, A GRACE PERIOD IS ALLOWED. GRACE PERIOD IS NOT OF FIXED DURATION, BUT LASTS UNTIL COMPLETION OF CONSTRUCTION.

3. WHILE COMPLIANCE IS USUALLY ACCOMPLISHED BY BURNING OF LOW-SULFUR FUELS, THERE HAS BEEN A LARGE INCREASE IN USE OF STACK-GAS CLEANING, AS THE PRICE OF SUCH EQUIPMENT GOES DOWN, AND EFFICIENCY RISES, AND AS THE COST OF LOW SULFUR FUEL INCREASES. HAMANAKA QUOTED A GENERAL COST OF AROUND \$15-20 PER KILOLITER OF FUEL OIL BURNED FOR STACK GAS CLEAN UP, AS COMPARED WITH \$30-40 PER KILOLITER DIFFERENTIAL BETWEEN PRICE OF LOW-SULFUR CRUDE (LESS THAN 1 PERCENT SULFUR) AND HIGH SULFUR CRUDE (GREATER THAN 2 PERCENT SULFUR). CRUDE WITH 1 TO 2 PERCENT SULFUR IS DESIGNATED MEDIUM SULFUR CRUDE. THUS, A SIZABLE ECONOMIC INCENTIVE EXISTS FOR USE OF STACK GAS CLEAN UP IN AREAS OF TIGHT CONTROL (LOW K VALUE).

4. AS IMPLIED IN ABOVE PARAGRAPH, FUEL USUALLY BURNED IN JAPAN IS OIL, AND MOST STACK GAS CLEANING HAS BEEN APPLIED TO OIL-BURNING FACILITIES. HAMANAKA WAS UNABLE TO PROVIDE FIGURE FOR TOTAL NUMBER OF STACK GAS FACILITIES IN OPERATION, BUT BELIEVES IT IS CONSIDERABLY GREATER THAN FIGURE OF 35 TO 40 CITED IN REFTTEL. DATA ON NUMBER OF INSTALLATIONS AND THEIR CAPACITY HAS BEEN REQUESTED FROM MITI, AND WILL BE AVAILABLE IN NEXT DAY OR TWO.

5. COAL IS, OF COURSE, BURNED TO SOME DEGREE IN JAPANESE POWER PLANTS, BUT ITS MAIN USE IS IN METALLURGICAL APPLICATIONS. JAPANESE COAL IS DERIVED FROM TWO PRINCIPAL AREAS: HOKKAIDO, WHICH IS LOW SULFUR CONTENT (0.2 - 0.3 PERCENT S), AND KYUSHU, UNCLASSIFIED

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WHICH IS HIGH-SULFUR (1 - 2 PERCENT S). THE ELECTRIC POWER DEVELOPMENT CO. (EPDC - JAPAN'S PRINCIPAL PUBLIC POWER COMPANY), OPERATES THREE COAL BURNING POWER PLANTS, ONE BEING IN THE ALREADY HEAVILY POLLUTED (RANK 1) YOKOHAMA AREA. TH IS PLANT WAS BUILT IN EARLY 60S, BEFORE GENERAL ADOPTION OF ENVIRONMENTAL CONTROLS IN JAPAN, BUT AGREEMENTS WERE REACHED WITH MUNICIPAL

AUTHORITIES ON LIMITATION OF EMISSION THROUGH USE OF LOW SULFUR COAL, THUS CONSTITUTING FIRST APPLICATIONS OF AIR POLLUTION CONTROLS IN JAPAN. ANOTHER COAL BURNING PLANT IS AT OMUTA IN KYUSHU. SINCE THIS PLANT BURNS HIGH SULFUR KYUSHU COAL, STACK GAS CLEANING FACILITIES WERE INSTALLED ONE OR TWO YEARS AGO. TO HAMANAKA'S KNOWLEDGE, THIS

IS ONLY USE OF STACK GAS CLEANING AT COAL BURNING PLANT, ALTHOUGH, AS ALREADY INDICATED, THERE ARE MANY EXAMPLES AT OIL-FIRED PLANTS.

6. FROM PROCESS STANDPOINT, HAMANAKA INDICATED THAT MAJORITY OF JAPANESE STACK GAS FACILITIES EMPLOYED WET LIME PROCESS, WITH SALE OF BY-PRODUCT GYPSUM TO CONSTRUCTION INDUSTRY HELPING REDUCE CLEAN-UP COST. TYPICAL PLANTS HAVE A CAPACITY OF 500,000 CUBIC METERS PER HOUR OF STACK-GAS, BUT ONE PLANT IS RATED AT 1,500,000 CU. METERS PER HOUR, CORRESPONDING TO REQUIREMENTS OF ABOUT 500 MW ELECTRICAL OUTPUT. WITH CURRENTLY DEPRESSED CONDITIONS IN CONSTRUCTION INDUSTRY, MARKET FOR BY-PRODUCT GYPSUM IS BECOMING RESTRICTED, BUT USE OF PROCESS IS STILL INCREASING.

7. OTHER PROCESSES INCLUDE, ACCORDING TO HAMANAKA (WHO ACKNOWLEDGED NOT BEING SURE OF NOMENCLATURE), (A) THE SODIUM SULFATE PROCESS, WHICH GENERATES A SULFITE BY-PRODUCT USED IN PAPER INDUSTRY; THUS PROCESS IS USED MAINLY AT POWER PLANTS ASSOCIATED WITH PAPER MILLS, (B) SULPHURIC ACID PROCESS, WHICH GENERATES BY-PRODUCT SULPHURIC ACID, (C) AMMONIUM SULFATE PROCESS, WHICH GENERATES AMMONIUM SULFATE AS BY-PRODUCT. THUS, ALL IMPORTANT PROCESSES BENEFIT IN SOME DEGREE FROM SALE OF BY-PRODUCTS, WHICH UNDER CURRENT ECONOMIC CONDITIONS IS BECOMING INCREASINGLY DIFFICULT. HAMANAKA SAID THAT ACTIVATED CARBON PROCESS DEVELOPED BY MITU'S NATIONAL INSTITUTE OF RESOURCES AND POLLUTION CONTROL HAD NOT PROVED ATTRACTIVE DUE TO HIGH COSTS.
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8. A NUMBER OF JAPANESE COMPANIES ARE INVOLVED IN CONSTRUCTION AND SALE OF STACK GAS CLEANING EQUIPMENT. AMONG THESE ARE MITSUBISHI KAKOKI AND CHIYODA ENGINEERING, A MAJOR CHEMICAL PLANT COMPANY WITH TIE-IN WITH US FIRM CHEMICO.

9. WITH REGARD TO NON-SCRUBBER TECHNOLOGY, HAMANAKA BELIEVES THERE IS LITTLE OR NO APPLICATION OF FRONT-END CLEAN-UP OF COAL. HE BELIEVES DEVELOPMENT OF SUCH TECHNOLOGY IS BEING UNDERTAKEN IN PROJECT SUNSHINE, JAPAN'S ENERGY R&D PROGRAM. APPLICATION OF TALL STACKS (150-200 METERS), HOWEVER, HAS BECOME INCREASINGLY COMMON SINCE LATE 1960'S. HOWEVER, UNDER NEW K VALUES TO BEGIN IN FEBRUARY, USE OF TALL STACKS ALONE WILL NOT PERMIT USE OF MEDIUM SULFUR OIL IN MOST TIGHTLY CONTROLLED ZONES.

10. LOOKING TO FUTURE, HAMANAKA CONCLUDED THAT INCREASED USE OF COAL WOULD DEPEND LARGELY ON ECONOMIC CONSIDERATIONS, RATHER THAN STRICTLY ENVIRONMENTAL ONES, SINCE THESE CAN BE OVERCOME AT A COST. HE POINTED OUT THAT, SINCE JAPANESE COAL RESERVES ARE LIMITED AND PRODUCTION HAS BEEN DECLINING FOR TWENTY YEARS, INCREASED USE OF COAL MEANT IMPORTS, AND THUS PRESENTED SAME ECONOMIC PRBLEMS AS OIL. JAPAN IS UNCERTAIN ABOUT FUTURE COAL AVAILABIITY FROM ABROAD, BUT IF PRICES REMAIN STABLE AND AVAILABILITY SEEMS ASSURED, HE BELIEVES THERE COULD BE CONSIDERABLY INCREASED USE. HE NOTED THAT ENVIRONMENTAL PROBLEMS OTHER THAN SO2 AFFECT COAL UTILIZATION; NAMELY, PARTICULATES AND NOX WHILE EMISSION STANDARDS ON THESE POLLUTANTS DO NOT SEEM TO BE PROHIBITIVE, BEST WAY OF OVERCOMING ENVIRONMENTAL PROBLEMS OF COAL IS THROUGH GASIFICATION, PRODUCING LOW BTU-GAS AT THE POWER PLANT SITE ITSELF. HE NOTED THAT TOKYO ELECTRIC POWER CO. (TEPCO) WAS ALREADY OPERATING TWO POWER PLANTS ON IMPORTED LNG. WHILE THIS WAS NOT STRICTLY NECESSARY FROM ENVIRONMENTAL STANDPOINT, COMPANY APPARENTLY CONCLUDED THAT ADVANTAGES OF THIS CLEAN FUEL TO THE COMPANY IMAGE WERE WORTH THE COST. FOR SAME REASONS, COAL GASIFICATION MAY APPEAR ATTRACTIVE TO POWER COMPANIES EVEN IF NOT MOST ECONOMICAL APPROACH.

11. EMBASSY ALSO CONTACTED DR. HASHIMOTO, WHO HAS PROMISED HIS EPIDEMIOLOGICAL REPORTS, EMBASSY WILL FORWARD THESE (OR ENGLISH SUMMARY) AS WELL AS MITI DATA ON STACK GAS CLEANING AS SOON AS AVAILABLE.

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Message Attributes

Automatic Decaptioning: X
Capture Date: 01 JAN 1994
Channel Indicators: n/a
Current Classification: UNCLASSIFIED
Concepts: POLLUTION CONTROL, WASTE DISPOSAL, SULFUR, STUDIES, TECHNOLOGICAL EXCHANGES, INDUSTRIAL PLANTS
Control Number: n/a
Copy: SINGLE
Draft Date: 29 JAN 1975
Decaption Date: 01 JAN 1960
Decaption Note:
Disposition Action: n/a
Disposition Approved on Date:
Disposition Authority: n/a
Disposition Case Number: n/a
Disposition Comment:
Disposition Date: 01 JAN 1960
Disposition Event:
Disposition History: n/a
Disposition Reason:
Disposition Remarks:
Document Number: 1975TOKYO01208
Document Source: CORE
Document Unique ID: 00
Drafter: n/a
Enclosure: n/a
Executive Order: N/A
Errors: N/A
Film Number: D750032-0924
From: TOKYO
Handling Restrictions: n/a
Image Path:
ISecure: 1
Legacy Key: link1975/newtext/t1975018/aaaaahho.tel
Line Count: 202
Locator: TEXT ON-LINE, ON MICROFILM
Office: ACTION COME
Original Classification: UNCLASSIFIED
Original Handling Restrictions: n/a
Original Previous Classification: n/a
Original Previous Handling Restrictions: n/a
Page Count: 4
Previous Channel Indicators: n/a
Previous Classification: n/a
Previous Handling Restrictions: n/a
Reference: 75 STATE 008995
Review Action: RELEASED, APPROVED
Review Authority: ShawDG
Review Comment: n/a
Review Content Flags:
Review Date: 11 APR 2003
Review Event:
Review Exemptions: n/a
Review History: RELEASED <11 APR 2003 by MarshK0>; APPROVED <25 FEB 2004 by ShawDG>
Review Markings:

Margaret P. Grafeld
Declassified/Released
US Department of State
EO Systematic Review
05 JUL 2006

Review Media Identifier:
Review Referrals: n/a
Review Release Date: n/a
Review Release Event: n/a
Review Transfer Date:
Review Withdrawn Fields: n/a
Secure: OPEN
Status: NATIVE
Subject: SPECIAL PANEL TO STUDY SULFUR OXIDE CONTROL TECHNOLOGY
TAGS: TECH, JA, US
To: STATE
Type: TE
Markings: Margaret P. Grafeld Declassified/Released US Department of State EO Systematic Review 05 JUL 2006